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4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Hillingdon Gardens SW Network Calculations	
Date 21/08/2019	Designed by MDS	
File Hillingdon SW Network C...	Checked by MDS	
Innovyze	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	1999
Site Location GB 507250 184950 TQ 07250 84950	
C (1km)	-0.025
D1 (1km)	0.304
D2 (1km)	0.321
D3 (1km)	0.230
E (1km)	0.305
F (1km)	2.546
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	40
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Inverts


Simulation Criteria for Storm


Volumetric Runoff Coeff 0.840	Additional Flow - % of Total Flow 40.000
Areal Reduction Factor 1.000	MADD Factor * 10m ³ /ha Storage 2.000
Hot Start (mins) 0	Inlet Coefficient 0.800
Hot Start Level (mm) 0	Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global) 0.500	Run Time (mins) 720
Foul Sewage per hectare (l/s) 0.000	Output Interval (mins) 6

Number of Input Hydrographs 0 Number of Storage Structures 6
 Number of Online Controls 1 Number of Time/Area Diagrams 4
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location GB 507250 184950 TQ 07250 84950	
C (1km)	-0.025
D1 (1km)	0.304
D2 (1km)	0.321
D3 (1km)	0.230
E (1km)	0.305

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Innovyze	Network 2018.1.1	
<div>Synthetic Rainfall Details</div> <div>F (1km) 2.546 Summer Storms No Winter Storms Yes Cv (Summer) 0.750 Cv (Winter) 0.840 Storm Duration (mins) 360</div>		
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Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 100.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF


PN	US/MH Name	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Discharge Vol (m ³)	Pipe Flow (l/s)
1.000	S1	34.750	34.575	0.320	0.000	0.01		33.588	3.5
2.000	S2	34.750	34.575	0.333	0.000	0.01		23.438	2.4
1.001	S3	34.750	34.575	0.360	0.000	0.03		135.098	14.0
3.000	S4	34.750	34.578	0.593	0.000	0.05		37.980	4.4
1.002	S5	34.750	34.577	0.467	0.000	0.05		230.564	25.7
4.000	S6	34.750	34.634	0.649	0.000	0.05		38.361	4.6
5.000	S7	34.970	34.579	0.419	0.000	0.02		63.436	7.5
6.000	S8	34.750	34.580	0.595	0.000	0.05		38.361	4.5
5.001	S9	34.750	34.579	0.472	0.000	0.04		162.943	18.1
1.003	S10	34.750	34.629	0.604	0.000	0.12		546.980	61.1
7.000	S11	34.800	34.619	0.511	0.000	0.01		35.709	4.0
8.000	S12	34.800	34.619	0.438	0.000	0.02		104.955	11.6
7.001	S13	34.800	34.619	0.551	0.000	0.06		140.760	18.5
9.000	S14	34.800	34.619	0.471	0.000	0.02		104.835	11.6
7.002	S15	34.800	34.619	0.584	0.000	0.08		268.731	35.4
10.000	S16	34.800	34.619	0.529	0.000	0.02		102.952	11.7
7.003	S17	34.800	34.619	0.641	0.000	0.12		383.647	51.5
11.000	S18	34.800	34.619	0.561	0.000	0.03		119.666	13.6
7.004	S19	34.800	34.619	0.690	0.000	0.16		507.666	70.8
1.004	S20	34.800	34.658	0.792	0.000	0.37		1021.875	126.4
1.005	S21	34.800	34.661	0.808	0.000	0.29		1109.349	137.3
1.006	S22	35.350	34.707	0.726	0.000	0.04		310.637	20.1
12.000	S23	35.500	34.718	0.928	0.000	0.01		50.408	5.9
1.007	S24	35.500	34.717	0.757	0.000	0.03		424.748	22.8
13.000	S25	35.650	34.727	1.035	0.000	0.01		40.842	5.5
1.008	S26	35.650	34.726	0.854	0.000	0.03		456.730	16.4
1.009	S27 / FC	35.920	34.726	0.886	0.000	0.02		443.983	11.6

PN	US/MH Name	Status
1.000	S1	SURCHARGED
2.000	S2	SURCHARGED
1.001	S3	SURCHARGED
3.000	S4	SURCHARGED
1.002	S5	SURCHARGED
4.000	S6	SURCHARGED
5.000	S7	SURCHARGED
6.000	S8	SURCHARGED
5.001	S9	SURCHARGED
1.003	S10	SURCHARGED

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Summary of Results for 360 minute 100 year Winter (Storm)

PN	US/MH Name	Status
7.000	S11	SURCHARGED
8.000	S12	SURCHARGED
7.001	S13	SURCHARGED
9.000	S14	SURCHARGED
7.002	S15	SURCHARGED
10.000	S16	SURCHARGED
7.003	S17	SURCHARGED
11.000	S18	SURCHARGED
7.004	S19	SURCHARGED
1.004	S20	SURCHARGED
1.005	S21	SURCHARGED
1.006	S22	SURCHARGED
12.000	S23	SURCHARGED
1.007	S24	SURCHARGED
13.000	S25	SURCHARGED
1.008	S26	SURCHARGED
1.009	S27 / FC	SURCHARGED

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D1 (1km)	0.304
D2 (1km)	0.321
D3 (1km)	0.230
E (1km)	0.305
F (1km)	2.546
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	40
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Simulation Criteria for Storm


Volumetric Runoff Coeff 0.840	Additional Flow - % of Total Flow 40.000
Areal Reduction Factor 1.000	MADD Factor * 10m ³ /ha Storage 2.000
Hot Start (mins) 0	Inlet Coefficient 0.800
Hot Start Level (mm) 0	Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global) 0.500	Run Time (mins) 2880
Foul Sewage per hectare (l/s) 0.000	Output Interval (mins) 24

Number of Input Hydrographs 0 Number of Storage Structures 6
 Number of Online Controls 1 Number of Time/Area Diagrams 4
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location GB 507250 184950 TQ 07250 84950	
C (1km)	-0.025
D1 (1km)	0.304
D2 (1km)	0.321
D3 (1km)	0.230
E (1km)	0.305

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<div>Synthetic Rainfall Details</div> <div>F (1km) 2.546 Summer Storms No Winter Storms Yes Cv (Summer) 0.750 Cv (Winter) 0.840 Storm Duration (mins) 1440</div>		
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Innovyze	Network 2018.1.1	

Summary of Results for 1440 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 100.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

PN	US/MH Name	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Discharge Vol (m ³)	Pipe Flow (l/s)
1.000	S1	34.750	34.468	0.213	0.000	0.00		47.326	1.3
2.000	S2	34.750	34.468	0.226	0.000	0.00		33.770	0.9
1.001	S3	34.750	34.468	0.253	0.000	0.01		202.565	5.2
3.000	S4	34.750	34.484	0.499	0.000	0.02		51.150	1.6
1.002	S5	34.750	34.491	0.381	0.000	0.02		360.307	9.1
4.000	S6	34.750	34.519	0.534	0.000	0.02		51.654	1.6
5.000	S7	34.970	34.470	0.310	0.000	0.01		85.879	2.6
6.000	S8	34.750	34.470	0.485	0.000	0.02		51.656	1.6
5.001	S9	34.750	34.476	0.369	0.000	0.01		241.076	6.8
1.003	S10	34.750	34.484	0.459	0.000	0.04		848.047	22.2
7.000	S11	34.800	34.496	0.388	0.000	0.00		50.243	1.3
8.000	S12	34.800	34.495	0.314	0.000	0.01		142.666	3.9
7.001	S13	34.800	34.496	0.428	0.000	0.02		231.491	6.1
9.000	S14	34.800	34.496	0.348	0.000	0.01		142.547	3.9
7.002	S15	34.800	34.497	0.462	0.000	0.03		440.987	11.5
10.000	S16	34.800	34.498	0.408	0.000	0.01		140.014	3.8
7.003	S17	34.800	34.498	0.520	0.000	0.04		635.707	16.7
11.000	S18	34.800	34.498	0.440	0.000	0.01		162.298	4.5
7.004	S19	34.800	34.498	0.569	0.000	0.05		867.375	23.3
1.004	S20	34.800	34.555	0.689	0.000	0.13		1715.779	44.0
1.005	S21	34.800	34.572	0.719	0.000	0.10		1836.145	47.3
1.006	S22	35.350	34.550	0.569	0.000	0.03		1549.732	12.2
12.000	S23	35.500	34.511	0.721	0.000	0.00		70.058	2.0
1.007	S24	35.500	34.511	0.551	0.000	0.01		1724.712	12.0
13.000	S25	35.650	34.507	0.815	0.000	0.00		57.097	1.6
1.008	S26	35.650	34.508	0.636	0.000	0.02		1802.721	12.1
1.009	S27 / FC	35.920	34.507	0.667	0.000	0.02		1796.282	11.6

PN	US/MH Name	Status
1.000	S1	SURCHARGED
2.000	S2	SURCHARGED
1.001	S3	SURCHARGED
3.000	S4	SURCHARGED
1.002	S5	SURCHARGED
4.000	S6	SURCHARGED
5.000	S7	SURCHARGED
6.000	S8	SURCHARGED
5.001	S9	SURCHARGED
1.003	S10	SURCHARGED

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Summary of Results for 1440 minute 100 year Winter (Storm)

	US/MH	
PN	Name	Status
7.000	S11	SURCHARGED
8.000	S12	SURCHARGED
7.001	S13	SURCHARGED
9.000	S14	SURCHARGED
7.002	S15	SURCHARGED
10.000	S16	SURCHARGED
7.003	S17	SURCHARGED
11.000	S18	SURCHARGED
7.004	S19	SURCHARGED
1.004	S20	SURCHARGED
1.005	S21	SURCHARGED
1.006	S22	SURCHARGED
12.000	S23	SURCHARGED
1.007	S24	SURCHARGED
13.000	S25	SURCHARGED
1.008	S26	SURCHARGED
1.009	S27 / FC	SURCHARGED